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(56) Documents Cited
GB 1549946 A GB 1511085 A GB 1092709 A
GB 1045426 A GB 0980194 A EP 0729801 A1
EP 0691484 A1

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(54) Abstract Title
Masonry core-cutting tool

(57) A core-cutting tool for masonry, comprises a support body 1 having a tubular coupling member 10 for connection to a drill via an adaptor and a mounting 2 for a tubular cutting member 5. The mounting comprises an annular surface 4 normal to the axis of rotation of the tool and a cylindrical wall 3 upstanding from the inner edge of the annular surface and extending coaxially with the axis of rotation in a direction away from the connection means. The wall has a plurality of mounting pins 8 spaced equidistantly around the circumference thereof and extending radially outwardly therefrom. The cutting member has slots 21 corresponding in position and number to the mounting pins. A dust extraction housing 11 is located around the coupling member 10.

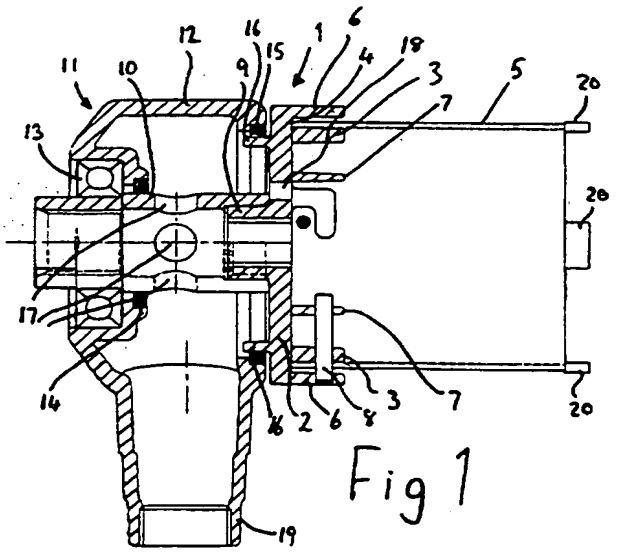

Fig 1

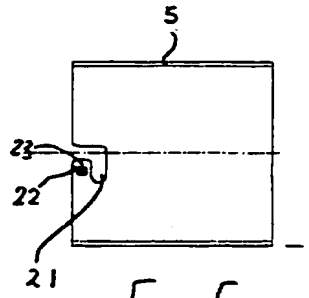

Fig 5

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The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1995

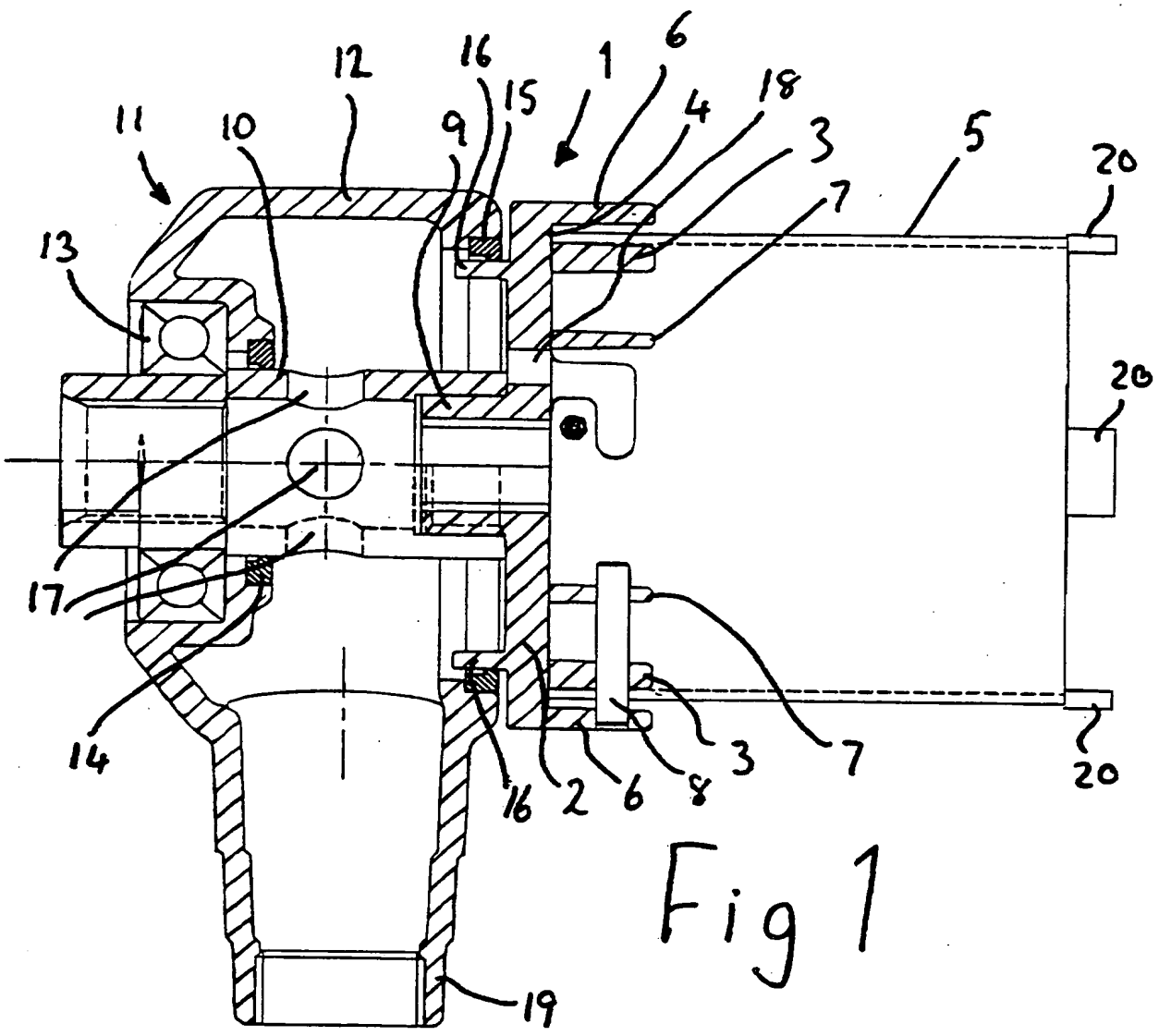

Fig 1

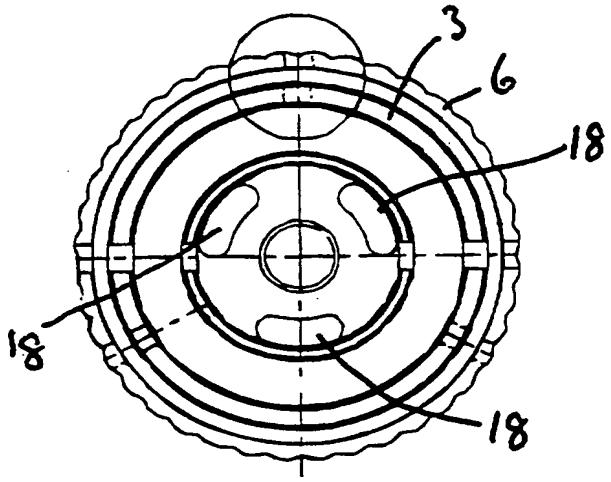

Fig 2

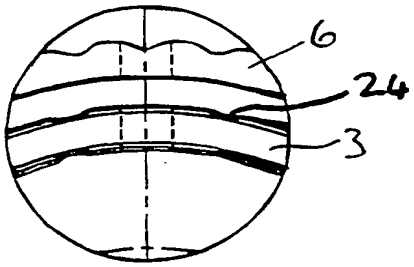

Fig 3

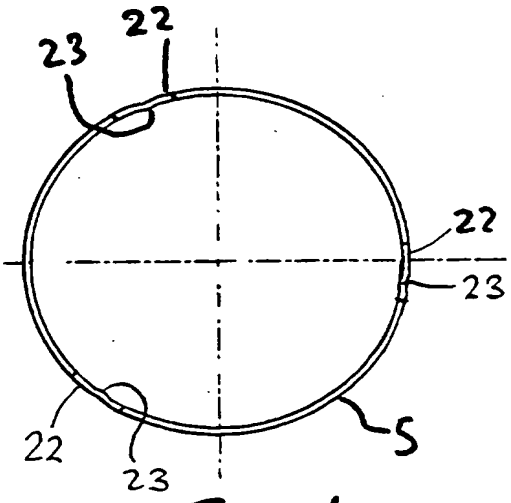

Fig 4

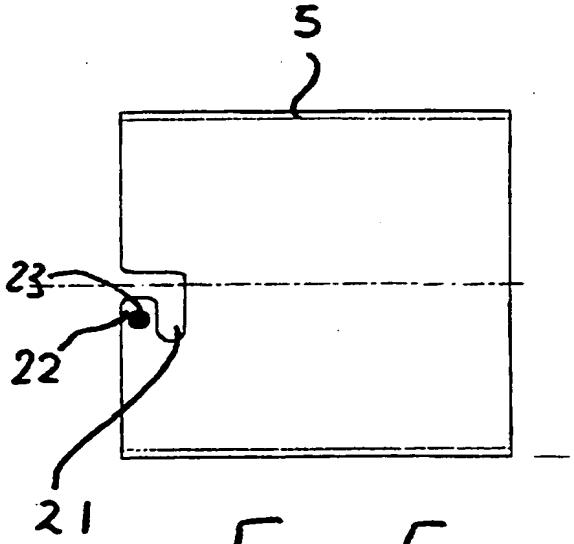

Fig 5

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MASONRY CORE-CUTTING TOOL

Field of the Invention

This invention relates to a core-cutting tool for masonry.

Background to the Invention

Masonry core-cutting tools are used, for example, to cut recesses or blind holes in plaster and masonry walls for the installation of electrical fittings, and to cut through holes to allow the passage of electrical cables, pipes, and the like through a masonry structure such as a wall. Conventionally, such tools consist of a tubular cutting member attached to a base, which is provided with mounting means for mounting the tool in a hand-held electric drill, for example. A problem with such tools is that it is difficult to remove the masonry core when cutting is complete, and the cost of replacement of the whole tool when worn is high.

Various proposals have been made for constructing the tool in two parts, with the cutting member separable from the base for ease of removal of the cores, and for ready replacement when the tool is worn. For example, EP-0 729 801A discloses a core-cutting tool in which the cutting member is provided with an outwardly-extending segmented flange around one end thereof, the flange segments being received in corresponding formations on the base. While this permits separation for extraction of the core, the construction of the cutting member is still relatively costly, and the arrangement increases the likelihood of the cutting member becoming jammed in place on the base as a result of build-up of masonry dust.

Summary of the Invention

According to the invention, there is provided a core-cutting tool for masonry, comprising a support body having connection means for connection to drive means and a mounting for a tubular cutting member, the mounting comprising an annular surface normal to the axis of rotation of the tool and a cylindrical wall upstanding from the inner edge of the annular surface and extending coaxially with the axis of rotation in a direction away from the connection means, the wall having a plurality of mounting pins spaced equidistantly around the circumference thereof and extending radially outwardly therefrom, and the cutting member having slots corresponding in position and number to the mounting pins and opening at one end of the cutting member to permit the cutting member to be mounted on the mounting means by locating it over the cylindrical wall and engaging the pins with the slots to retain the cutting member on the mounting during the rotation of the tool.

Preferably each slot is generally L-shaped, whereby the pins are engaged by a bayonet action in the slots. The tab of metal encompassed by the arms of the L of each slot is preferably bent inwardly so as to grip the wall. The tab may be provided with an inward projection engageable in a corresponding recess provided in the wall so as to cause a locking action when the cutting member is correctly engaged on the mounting means.

The connection means is such as to permit connection to drive means such as an electric drill, but other types of drive, such as hydraulic or pneumatic, could be used, and the connection means may, for example,

comprise a screw-threaded connection, or a spindle to be received by a drill chuck.

The mounting means may co-operate with a housing connectable to a vacuum pump to permit extraction of dust generated during the cutting process, or connectable to a supply of water or other coolant to permit the water or coolant to be fed to the cutting tool to cool it and to wash away the dust. The housing is suitably formed from a flexible plastics material, such as polypropylene.

The tool of the invention is simple and convenient to use and replacement cutting members can be manufactured more cheaply than prior art configurations.

Brief Description of the Drawings

In the drawings, which illustrate an exemplary embodiment of the invention:

Figure 1 is a sectional side elevation of the tool;

Figures 2 and 3 are respectively end and side views of the cutting member;

Figure 4 is an end view of the mounting member of the tool shown in Figure 1; and

Figure 5 is an enlarged view of the ringed portion of Figure 4.

Detailed Description of the Illustrated Embodiment

Referring first to Figure 1, the tool comprises a base 1 consisting of a disc 2 having a first tubular wall 3 upstanding therefrom at a short distance radially in from the periphery thereof. The portion 4 of the disc outside this wall 3 defines an annular surface for receiving the cutting member 5, described hereinafter. A second tubular wall 6 coaxial with the

first extends from the periphery of the disc 2. A third tubular wall 7 is provided on the disc, coaxial with and inside the first wall 3. Three mounting pins 8 pass radially outwardly from the third wall 7, through the first wall 3, to terminate in the second wall 6. The pins 8 are equi-spaced so as to subtend angles of 120° between them, as may be seen from Figure 4.

A central hollow spigot 9 extends from the centre of the disc 2 on the opposite face from the walls 3, 6 and 7. The spigot is externally screw threaded so as to be engageable with an internal screw thread in a tubular coupling member 10 within a dust-extraction housing 11. The housing 11 has a moulded plastics body 12 holding a bearing 13 which carries the coupling member 10. A first flexible sealing ring 14 separates the bearing 13 from the interior of the housing 11, while a second sealing ring 15 contacts a tubular wall 16 extending from the disc 2 on the same side thereof as the spigot 9 to provide a rotary seal.

The coupling member 10 has an internal thread at the end opposite the spigot 9 to permit connection to a drill via an adaptor/drill bit holder (where provision for the drilling of a pilot hole is made), and four holes 17 through the wall thereof to permit fluid flow between the interior of the coupling member 10 and the interior of the housing 11. The interior of the coupling member 10 communicates in turn with the interior of the cutting member 5, and there is also direct communication between the interior of the cutting member and the interior of the housing by way of apertures 18 through the disc 2 just inside the third wall 7, as may be seen more clearly from Figure 4.

The housing 11 has an inlet/outlet connection 19 at one side internally threaded to receive a vacuum pipe or a water connector. Thus, for example, the dust generated during the cutting of masonry may be extracted from the interior of the cutting member and conducted away for collection, or water may be supplied to the interior of the cutting member during cutting so as to keep the cutting member cool and to wash away the dust.

The cutting member 5 comprises a tube having cutting teeth 20 spaced around the periphery at one end thereof. The teeth 20 may be surfaced with diamond grit or the like to enhance the cutting action on the masonry. As may be seen from Figures 2 and 3, the opposite end of the cutting member is provided with three L-shaped slots 21 equi-spaced around the periphery thereof to provide a bayonet fitting with the pins 8. The tab 22 of metal within the L is bent slightly inwardly to bear against the first wall 3, the springiness of the metal causing the tab to exert a gripping force thereon. The effect of this is enhanced by means of a projection or dimple 23 on the tab 22 directed inwardly, engaging in a corresponding small recess 24 in the wall 3, as may be seen in Figure 5. The action of the three equi-spaced tabs 22 is to hold the cutting member centrally on the base, ensuring accurate positioning, and to resist the likelihood of the cutting member becoming detached from the base inadvertently. Removal of the cutting member by the operator, for removal of a masonry core therefrom, or for replacement of the worn-out cutting member, is straightforward. The provision of the outer wall provides a guide as to cutting depth, as well as ensuring that the cutting

member is held firmly. The bayonet arrangement is resistant to jamming resulting from any build-up of dust in the base.

CLAIMS

1. A core-cutting tool for masonry, comprising a support body having connection means for connection to drive means and a mounting for a tubular cutting member, the mounting comprising an annular surface normal to the axis of rotation of the tool and a cylindrical wall upstanding from the inner edge of the annular surface and extending coaxially with the axis of rotation in a direction away from the connection means, the wall having a plurality of mounting pins spaced equidistantly around the circumference thereof and extending radially outwardly therefrom, and the cutting member having slots corresponding in position and number to the mounting pins and opening at one end of the cutting member to permit the cutting member to be mounted on the mounting means by locating it over the cylindrical wall and engaging the pins with the slots to retain the cutting member on the mounting during the rotation of the tool.

2. A core-cutting tool according to Claim 1, wherein each slot is generally L-shaped, whereby the pins are engaged by a bayonet action in the slots.

3. A core-cutting tool according to Claim 2, wherein the tab of metal encompassed by the arms of the L of each slot is bent inwardly so as to grip the wall.

4. A core-cutting tool according to Claim 3, wherein the tab is provided with an inward projection engageable in a corresponding recess provided in the wall so as to cause a locking action when the cutting member is correctly engaged on the mounting means.

5. A core-cutting tool according to any preceding claim, wherein the connection means comprise a screw-threaded connection, or a spindle to be received by a drill chuck.

6. A core-cutting tool according to any preceding claim, wherein the mounting means co-operate with a housing connectable to a vacuum pump to permit extraction of dust generated during the cutting process, or connectable to a supply of water or other coolant to permit the water or coolant to be fed to the cutting tool to cool it and to wash away the dust.

7. A core-cutting tool according to Claim 6, wherein the housing is formed from a flexible plastics material, such as polypropylene.

8. A core-cutting tool, substantially as described with reference to, or as shown in, the drawings.

Amendments to the claims have been filed as follows

1. A core-cutting tool for masonry, comprising a support body having connection means for connection to drive means and a mounting for a tubular cutting member, the mounting comprising an annular surface normal to the axis of rotation of the tool and a first cylindrical wall upstanding from the inner edge of the annular surface and extending coaxially with the axis of rotation in a direction away from the connection means, the wall having a plurality of mounting pins spaced equidistantly around the circumference thereof and extending radially outwardly therefrom, and the cutting member having slots corresponding in position and number to the mounting pins and opening at one end of the cutting member to permit the cutting member to be mounted on the mounting means by locating it over the cylindrical wall and engaging the pins with the slots to retain the cutting member on the mounting during the rotation of the tool, and a second cylindrical wall upstanding from the outer edge of the annular surface, whereby in use the cutting member is located between said first and second walls.

2. A core-cutting tool according to Claim 1, wherein each slot is generally L-shaped, whereby the pins are engaged by a bayonet action in the slots.

3. A core-cutting tool according to Claim 2, wherein the tab of metal encompassed by the arms of the L of each slot is bent inwardly so as to grip the wall.

4. A core-cutting tool according to Claim 3, wherein the tab is provided with an inward projection engageable in a corresponding recess

provided in the wall so as to cause a locking action when the cutting member is correctly engaged on the mounting means.

5. A core-cutting tool according to any preceding claim, wherein the connection means comprise a screw-threaded connection, or a spindle to be received by a drill chuck.

6. A core-cutting tool according to any preceding claim, wherein the mounting means co-operate with a housing connectable to a vacuum pump to permit extraction of dust generated during the cutting process, or connectable to a supply of water or other coolant to permit the water or coolant to be fed to the cutting tool to cool it and to wash away the dust.

7. A core-cutting tool according to Claim 6, wherein the housing is formed from a flexible plastics material, such as polypropylene.

8. A core-cutting tool, substantially as described with reference to, or as shown in, the drawings.

The Patent Office

Application No:	GB 9708303.4	**Examiner:**	Hal Young
Claims searched:	1-8	**Date of search:**	15 June 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): B3C ; B4C ; B5L(LEB, LEX, LUX, LQ) ; F4X

Int Cl (Ed.6): B23B(31/113 ; 51/04) ; B28D(1/04)

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
Y	GB1549946	(BOSCH), see figs 2,4,6,8.	6
A	GB 1511085	(SEGAL)	
A	GB 1092709	(TREVATHAN)	
X Y	GB 1045426	(BLACK&DECKER), see figs 1-4.	1,2 6
Y	GB 980194	(PHILLIPS), see figs 1-3.	6
A	EP 0729801 A1	(BIEDRON)	
X Y	EP 0691484 A1	(GEISSLER), see figures.	1,2,5 6

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.